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MOTIVATION OF LEARNING: AN ASSESSMENT OF THE PRACTICALITY AND EFFECTIVENESS OF GAMIFICATION WITHIN A TERTIARY EDUCATION SYSTEM IN MALAYSIA

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ABSTRACT
In light of the many criticisms about the Malaysian education system unable to stimulate intrinsic academic motivation among students, this research paper aims to address this issue by assessing the practicality and effectiveness of implementing gamification within education as a viable solution. To do so, the variable factors that determine the effectiveness of gamification need to be identified. Through extensive journal research, the two main factors were identified as past gaming experience (PGE) influenced by intrinsic gaming motivation and personality/learning styles. Through a total of 186 surveys collected, it is found that university students' perceived effectiveness of gamification is largely independent of past gaming experience and personality/learning styles, except for reducing academic amotivation and stimulating intrinsic motivation. Despite unable to find a suitable model to explain the factors of an effective gamified education, this paper has met its objectives by confirming the fact that gamification does in fact help to tackle the academic motivational problem Malaysia's education system is currently facing. Furthermore, backed with a mild positive general response from students, it shows that gamification, being independent of past gaming experience and personality/learning style is practical and effective among all students when applied in Malaysia.

1. INTRODUCTION
In recent years, education has arisen as among one of key issues that face consistent criticism and denigration by various bodies in Malaysia. As reported in the News Straits Times by Rajaratenam (2012), the current education system does not instil the intrinsic motivation to learn within students. Instead, it actually suppresses intrinsic motivation by directing students' focus towards extrinsic rewards that comes with performing well in school (Rajaratenam, 2012). Furthermore, employers have stated that current education system does not fulfil its role in fulfilling certain criteria such as imparting soft skills and critical thinking skills to graduates in order to obtain jobs (Borneo Post Online, 2012).

This growing concern has spurred this research in regards to the education system, specifically tertiary education. With this, there are several suggestions in reforming the current education system. One of the more promising solutions would be to apply gamification into education

(Lee and Hammer, 2011). Although widely applied into other context, gamification is a relatively new concept among educators. Gamification is defined as "the use of game design elements in non-game contexts to achieve the desirable outcome or behaviour" (Sicart, Deterding, Nacke, O'Hara and Dixon, 2011).

Applying gamification into education, it may have the ability to "motivate students to learn better and care more about school" according to Lee and Hammer (2011). By revamping the normal classroom learning process, gamification helps to enhance students' interaction with their education materials and their learning experience, thus helps the cultivation of the intrinsic motivation to learn.

As the concept of gamification is still in its embryonic stage, there is a scarce resource of research papers and journals on this concept. Therefore, this research aims to consolidate existing research journals with the purpose of coming out with an accurate model, backed with empirical data to determine the effectiveness of gamification and its factors which include personality, learning styles and past game experience. This model would then in turn be used to examine the practicality and effectiveness of gamification in Malaysia's education.

2. LITERATURE REVIEW

2.1 Defining gamification

Delving deeper on gamification's general definition of "the use of game design elements in non-game contexts", Smith-Robbins (2010) took a simplistic approach in defining game elements into three basic characteristics, a goal, an obstacle and collaboration or competition. On the other hand, Bunchball Inc. (2010) separated game elements as two different components, game mechanics and game dynamics. Game mechanics is defined as various actions, behaviour, and control mechanisms used to" gamify" an activity using points, levels, challenges , leaderboards and gifts. Meanwhile, game dynamics is defined as game motivators such as rewards, status, achievement, self-expression, competition, and altruism.

Besides, it is necessary to clarify that although the majority of current gamification examples are digital under the present context where media convergence and information technology are ubiquitous, gamification is not restricted to the use of technology and digital medium but extends to other instruments such as pen and paper and physical activities (Dixon et al, 2011).

2.2 Motivators as the key determining factor for effective gamification

To understand the role of gamification in education, in turn means understanding under what circumstances game elements can help drive intrinsic academic motivation (Lee and Hammer, 2011). Gottfried (1990) defines intrinsic academic motivation as "enjoyment of school learning characterized by a mastery orientation; curiosity; persistence; task-endogeny; and the learning of challenging, difficult, and novel tasks".

Rules, Play and Culture Model

From Salen and Zimmerman's *Rules, Play, and Culture* framework (2003) on game designs, the impact of gamification is influenced by three main contexts arranged in ascending sphere of influence - the rules of the game, the players and the context the players are in. To elaborate, when implementing an effective gamification within education through designing of "game" rules and game mechanics, the education culture that encircles the players and player/students' type including personality and emotional experiences and social positioning are needed to be

taken into consideration (Lee and Hammer, 2011). The game rules designed is necessary to compliment both the players and their culture to be both fun and engaging.

Motivations Interaction Model

Deterding (2011) came up with a theoretical model to conceptualize the motivational pull of single game design elements in varying contexts. When implementing gamification onto different context to facilitate a desired outcome, there will be an interaction between the motivations from the context/situation and the motivation from gamification. For example, implementing a scoreboard to motivate salespersons would induce them to achieve not only because of personal satisfaction, but also monetary desire and to avoid social consequences and criticisms for underperforming (Deterding, 2011). There must be successful interaction between both elements of motivators to ensure intrinsic academic motivation is spurred to achieve effective gamification within education.

2.3 Analysing and synthesizing complied findings

Based on previous research papers and journals, gamification is mainly defined as a catalyst to expedite learning through engagement and motivation. However, besides acting as a motivation, gamification also assists in actual learning by promoting knowledge application, improving soft skills and cognitive abilities. Collaborations with team members, formulating creative strategies and applying learnt knowledge into the gaming context are a few of the many examples that promote learning.

Besides, although models from Salen and Zimmerman (2003) and Deterding (2011) provide noteworthy explanation about the detailed process towards effective gamification, both models have their own drawbacks. Despite clearly explaining on what determines an effective game design, Salen and Zimmerman's "rule" factor would appears to be unquantifiable when it comes to assessing the general effectiveness of gamification. This is because of the nearly infinite ways to engineer game mechanics. On the other hand, Deterding's model excluded openness and acceptance which highly influences motivation as a key variable that determines the effectiveness of gamification.

3. METHODOLOGY

3.1 Participants

200 questionnaires were distributed randomly to University students within Malaysia who were in their 2nd and final undergraduate year; however only 186 were usable. Due to the fact that gamification is still very new concept to Malaysians, hence a brief description of gamification was included within the questionnaires. It is intended to be brief with no specific degree of gamification being emphasized so that it would not limit and affect respondents' perception towards the general idea of gamification and its effectiveness.

3.2 Research Instruments

The questionnaire was composed of four parts. The first part comprised of questions on the gaming habits and past gaming experience (PGE) of subjects. Then, a Myers-Briggs' Type Indicator personality test, taken from Daft's (2011) leadership textbook was conducted to identify the subjects' personality. The perceived effectiveness of gamification of respondents is explored in the third part of the questionnaire using perceived learning opportunities, openness and acceptance towards gamification and academic motivation. Perceived learning opportunities were measured using Hargreaves's (2005) suggested variables on defining

educational effectiveness. The Hasan's (2005) student confirmatory factor model was adapted to measure students' openness and acceptance towards gamification. Academic motivation was measured using an adapted version of college academic motivation scale by Vallerand et al. (1989). These items were modified to suit the context of this study. The last part of questionnaire aims to collect respondents' demographic data. A pilot test has been conducted to confirm the validities and reliabilities of these instruments.

Varimax rotation in factor analysis was used in making sure the items are tapping into the right constructs. Factor loadings less than 0.4 were suppressed. Besides that, the 9 items with inter-item correlation less than 0.4 were removed. The items were regrouped into 8 new factors as shown in the table 1 below. The KMO measure for the new factors was greater than 0.5 and the Barlett's test of sphericity was significant ($p< 0.5$).

A reliability test were then taken and all the reliability values exceeded 0.7 (Chronbach alpha >0.6), indicating a fairly high internal consistency of our scale.

Table 1: The 8 new factors formulated after factor analysis

Factors	***No of items***	***Item Variables***
Past General Gaming Experience	3 items	PGE_1 ,PGE_4, PGE_5
Game Engagement	2 items	PGE_2, PGE_3
Knowledge Acquisition & Application	4 items	PLO_1, PLO_2, PLO_3, PLO_4
Personal and Social Skills	4 items	PLO_6, PLO_7, PLO_8, PLO_10
Receptiveness towards Gamification	8 items	OA_1, OA_2, OA_3, OA_4, OA_5, OA_6, AM_1, AM_3
Intrinsic Motivation	2 items	AM_8, PLO_12
Extrinsic Motivation	3 items	AM_6, AM_7, AM_10
Amotivation	2 items	AM_4, AM_12

3.3 Data analysis

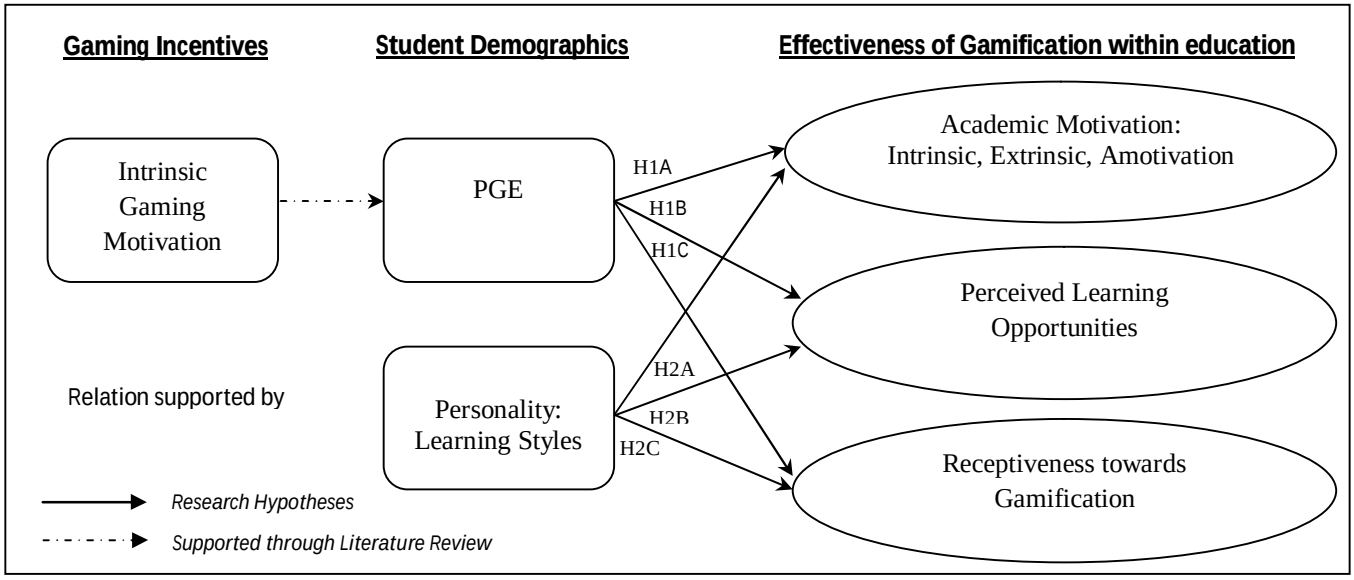
Two statistical analysis programmes which are SPSS18.0 and Microsoft Excel2007 were used in tabulating and analyzing the statistical data in this research. The data collected were subjected to exploratory factor analysis and reliability test. 28 items were restructured into 8 new factors for analysis as seen above.

ANOVA was used to determine whether there is a significant difference in the perceived effectiveness of a gamified education among the 4 types of personalities. Also, the relationship between the respondent's PGE and their perceived effectiveness of gamification was being examined using simple bivariate correlation.

4. RESEARCH FRAMEWORK AND ANALYSIS

4.1 Conceptual framework and hypothesis/model development

Analysis of the above literature review has resulted in the following conceptualized model and hypothesis:



Research Hypothesis

- Hypothesis 1A.I: PGE influence intrinsic academic motivation
- Hypothesis 1A.II: PGE influence extrinsic academic motivation
- Hypothesis 1A.III: PGE influence amotivation academic motivation
- Hypothesis 1B: PGE influence perceived learning opportunities
- Hypothesis 1C: PGE influence receptiveness towards gamification
- Hypothesis 2A.I: Personality influence intrinsic academic motivation
- Hypothesis 2A.II: Personality influence extrinsic academic motivation
- Hypothesis 2A.III: Personality influence amotivation academic motivation
- Hypothesis 2B: Personality influence perceived learning opportunities
- Hypothesis 2C: Personality influence receptiveness towards gamification

4.2 Rationalization of framework's validity

As seen from above, adopting models from Salen and Zimmerman (2003) and Deterding (2011), this model seeks to explore the interaction of students' intrinsic gaming motivation levels measured through PGE and personalities with the effectiveness of gamified education.

Besides focusing on motivation, additional variables are added which includes openness and acceptance and perceived learning opportunities to accurately assess gamification's ability to generate effective education. Gamification's effectiveness is hypothesised to be influenced by players/students' learning styles categorized through personalities, gaming motivation determined through gaming experience and society. However, due to this research's limited scope, the "society" factor is excluded from the model and held fixed in this context/research as it is assumed that Malaysia university students experience the same societal implications.

4.3 Independent Variables

Definition of Intrinsic Gaming Motivation and its derivation from games mechanics

Promptly explained by Ryan (2009), intrinsic motivation is defined as the doing of an activity for its inherent satisfaction, not for some separable consequence. When intrinsically motivated, a person is moved to act for the fun or challenge entailed rather external products, pressures or reward. While intrinsic motivation emanates in many forms, intrinsic gaming motivation can be mainly classified into autonomy, self-confidence, challenge, goals and social approval. Such

intrinsic motivation can be generated through the infinite variability of game mechanics by imposing challenges, stimulating curiosity, encouraging autonomy through controls and creating fantasy to allow people to vicariously experience satisfaction unavailable in real life (Moon and Baek, 2009).

Definition of PGE and Its Usage as a Measurement for Intrinsic Gaming Motivation

The purpose of using PGE as a variable is to provide as gateway/linkage to analyze the interaction between gaming motivation and gamification. Positive experience is defined by Csikszentmihalyi (1975) as "flow" or autotelic experience which consists of enjoyment, complete concentration, and deep involvement. Positive experience and engaging in an activity for intrinsic rewards, is very similar regardless of the applied context which the latter is defined as engagement for the pleasure and self-gratification derived from their performance (Csikszentmihalyi, 1975). Therefore, due their close inter-relatedness in meaning and expression, it can be inferred that a positive gaming experience is due to experiencing high level of intrinsic gaming motivation and vice versa.

Definition of Personality, Personality Types extracted from Myer Briggs and Keirsey Model and its effects on learning styles

Personality is defined as the dynamic organization, inside the person, of psychophysical systems that forms and explains the person's characteristic patterns of behavior, thoughts and feelings (G.W.Allport, 1961). Using Myer Briggs personality classification, it takes into consideration of four different components to explain a specific personality pattern. These four components include Extrovert/Introvert, Sensing/Intuition, Thinking/Feeling and Judging/ Perceptive. From these four components, Keirsey narrowed down and bundled specific personality indicators into four main types of personality types, Artisan, Guardian, Idealist and Rational. According to Busato, Prins, Elshout & Hamaker (1998), it is important to note that these personalities have a significant influence student's preferred learning styles (Chamorro-Premuzic and Furnham, 2003).

According to Western Nevada College (2012), the table below shows the different learning styles exhibits by students:

Table 2: Leaning styles of different personalities

Personality Types	Preferred Learning Styles
Guardians	Prefer meaningful structured learning routines, customs and procedures. Dislike unpredictability. Detail oriented. Good at memorization, repetition and step-by-step presentations. Rather conservative in speaking out in class.
Artisans	Enjoy hands-on, applied learning with a fast pace and freedom to explore. Learn through action and activities such as giving demonstrations, repairing things, drawing, delivering oral presentations or conducting experiments
Idealists	Enjoy learning about ideas and values. Idealists prefer able to see things from multiple perspectives. Like open-ended question because they can add their views and thoughts.
Rationalists	Enjoy logically presented lectures about abstract and intellectual subjects, and they will usually follow up through reading. They enjoy completing long-term independent projects because they want stimulation and new ideas.

4.4 Dependent Variables

Definition of Academic Motivation: Intrinsic, Extrinsic and Amotivation

Intrinsic Academic Motivation

Gottfried (1990) defines intrinsic academic motivation as the ideal academic motivation defined as "enjoying of school learning characterized by a mastery orientation; curiosity; persistence; task-endogeny; and the learning of challenging, difficult, and novel tasks". Students are motivated to constantly seek knowledge to satisfy their curiosity and for self-gratification. As such, gamification is implemented with the intention to increase intrinsic academic motivation, conditioning students to enjoy the experience of meeting with intellectual educational challenges and overcoming it, thus cultivating the habit of life-long learning (Smith-Robbins, 2010).

Extrinsic Academic Motivation

Another form of academic motivation is expressed in the form of extrinsic motivation which is defined as "actions carried out to achieve some instrumental end such as earning a reward or avoiding a punishment" (Nakanishi, 2002); intentions to carry out actions are caused by external stimulus. This form of academic motivation is deemed as a deterrent towards the spur of the "ideal" motivation, intrinsic academic motivation. An example brought forth by Krystle (2011) is the current education system. With students forgoing intrinsic motivation of learning while focus solely on the extrinsic motivation to attain good grades and degrees, it clearly overshadowed students' intrinsic academic motivations (Seth, 2011).

Academic Amotivation

The final and lowest form of motivation is amotivation. It is defined as lacking intention from external and internal stimulus to act and is manifested through passiveness or when there is no sense of intending to do what one does (Ryan and Deci, 2002). A form of academic amotivation would be attending school without any reason. According to Abramson, Seligman, and Teasdale (1978), academic amotivation is generally discouraged as it is caused by negative state of the mind such as learned helplessness, low self-esteem and depression. (Ahmed and Bruinsma, 2006).

Definition of Perceived learning opportunities

In order to assess the effectiveness of gamification within the field of education, gamification must have the capability and potential to deliver effective education besides efficiently imparting knowledge through promoting intrinsic motivation. Stated by Sujata (2007), for education to be effective, education should not only encompass academic achievement but also personal and social development. These include developing personal and social skills and practical knowledge application and acquisition, inclusive of the capability to retain knowledge (Hargreaves, 2005).

Definition of Openness and Acceptance

Cooper (1994) has defined genuine openness as "a readiness to connect the new with the old and to restructure, if necessary, the whole web of our belief". With the idea of gamification being a relatively bizarre concept among students, especially in the Asian context who prefer passive learning (Kember, 2000), it is essential to ensure that the general student's mindset are in favor towards gamification, in order to fully realize its potential benefits. If gamification is met without openness and acceptance but only resistance, it would only undermine its effectiveness in delivering education and knowledge. Therefore, it is an important factor to consider when assessing effectiveness of gamification within education.

5. ANALYSIS OF RESPONDENTS DEMOGRAPHIC

5.1 Respondents Demographic Profile

Table 3: Respondents Demographic Profile

Demographic Factors	Freq	%	Perceived Learning Opportunities	Intrinsic Motivation	Extrinsic Motivation	Amotivation	Receptiveness Towards Gamification
General Population	186	100	3.4684	3.4247	3.1398	2.3952	3.6324
Gender							
Male	90	48.4	3.4820	3.4556	3.1630	2.3611	3.6556
Female	96	51.6	3.5008	3.3958	3.1181	2.4271	3.6107
University							
Sunway	86	46.2	3.5756	3.5174	3.1938	2.3605	3.7471
Others	100	53.8	3.3763	3.3450	3.0933	2.4250	3.5338
Course							
Accounting & Finance/ ACCA	42	22.6	3.6756	3.6429	3.1984	2.4048	3.8125
Psychology	44	23.7	3.4545	3.3864	3.1061	2.3409	3.5994
Pharmacy / Medical	25	13.4	3.2900	3.3400	3.0133	2.3600	3.3530
Pre-University	26	14.0	3.3846	3.4231	3.1282	2.3846	3.6490
Others	49	26.3	3.4388	3.3163	3.1905	2.4592	3.5485

From the total of 186 respondents, the distributions are considerably even in terms of gender (48.4% Male, 51.6% Female) and university attended (46.2% Sunway, 53.8% Others). Taking this into consideration, there seems to be no strong evidence that any of these demographic factors affect the variables measured in this research. There are slightly higher differences when observing the data through the courses each respondent is currently studying, such as the 0.3825 mean difference of "Perceived Learning Opportunities" between Accounting & Finance/ACCA students and Pharmacy/Medical students. However, the difference can be considered negligible, as the difference in means is still very small.

According to table 5.1, the respondents for this research did not have strong opinions in regards to the concept of gamifying education. The data suggests that the respondents are only slightly agreeable with the idea, or may not even have an opinion at all. This may be due to the fact that gamification is a considerably new idea for the respondents. As a result, the factor of uncertainty avoidance has to be taken into consideration. Uncertainty avoidance "is the extent to which people feel comfortable in the presence of vagueness and ambiguity" (Yeniyurt and Townsend, 2003). This particular theory could have affected the respondents' overall perception of gamification, thus they selected more neutral responses.

6. ANALYSIS OF RESEARCH HYPOTHESIS AND MODEL

6.1 Hypothesis 1A.I: PGE influence intrinsic academic motivation

Showed in table 4, there is a negligible insignificant positive correlation ($r=0.120$, $p=0.104$, >0.05) between PGE and intrinsic academic motivation. With the significant level clearly above 0.05, this shows that there is no relationship between PGE and intrinsic academic motivation. Intrinsic gaming motivation derived from PGE has a negligible influence towards intrinsic academic motivation. According to the self-determinant theory which expounds on the

concept of environment as a determinant of the nature of motivation, it suggests that for intrinsic motivation to be stimulated, the environment should feature autonomy, competence and relatedness, and fulfillments considered essential towards human needs (Ryan, 2009).

Under the context of games, playing or participating is purely volitional, simulating a healthy environment for spurring intrinsic motivation. However, when game mechanics are applied within the context of education, where learning is obligatory as it is deemed directly related to future job prospects within Asian context, the stimulation of intrinsic motivations are less optimal compared to an environment where autonomy strives (Deci and Ryan, 2008); for example, playing games during free time. These succinctly explain the weak correlation between intrinsic gaming motivation and academic motivation which is inherently due to the controlled, regulated orientation of education that lacks autonomy and "free-will", in the face of societal pressures and norms (Deci and Ryan, 2008).

6.2 Hypothesis 1A.II: PGE influence extrinsic academic motivation

There is a negligible and significant positive correlation, ($r=0.164$, $p=0.026$, <0.05), showed in table 4, between PGE and extrinsic motivation. Students of varying levels of intrinsic gaming motivation depicted from their PGEs are able to learn through gamification without risking the increase of their extrinsic motivation out-shadowing their current intrinsic academic motivation, hindering learning. Independent of intrinsic gaming motivation, it is viable to consider that extrinsic academic motivation is influenced by other factors such as societal upbringing and culture. In Asian context, students are regularly prompt by external sources such as parents and media that education will lead to higher pay (Kember, 2000).

6.3 Hypothesis 1A.III: PGE influence amotivation academic motivation

There is a moderate significant negative correlation ($r=-0.310$, $p=0.00$, <0.05), refer to table 4, between PGE and academic amotivation. This shows that when gamification is applied, there would be a decrease in academic amotivation among students that scored high in PGE and high intrinsic gaming motivation. However, with the decrease in academic amotivation, there is neither an expected increase in either intrinsic or extrinsic academic motivation's correlation with positive gaming experience (refer to section 6.1 and 6.2). It can be deduced that with gamification applied, students' academic amotivation is substituted with intrinsic gaming motivation instead of intrinsic and extrinsic academic motivation when learning. Nevertheless, this would prove to be a good start for slowly shifting students' motivation to learn from gaming towards pure intrinsic academic motivation.

6.4 Hypothesis 1B: PGE influence perceived learning opportunities

Refer to table 4, the negligible significant positive correlation ($r=0.193$,$p=0.01$, <0.05) clearly shows that in spite of positive PGE derived from high levels of intrinsic gaming motivation, it does not have any impact towards perceived learning opportunities. This may imply that students' intrinsic gaming motivations do not have a biased influence towards the students' perception of what they are able to learn from gamification. In addition, from the slight agreeableness towards additional learning opportunities of a mean of 3.4, this further shows that students would remain somewhat receptive towards the perceived learning potential from gamification despite low intrinsic gaming motivation and negative gaming experience.

6.5 Hypothesis 1C: PGE influence receptiveness towards gamification

There is an negligible significant positive correlation ($r=0.163$, $p=0.028$,<0.05) between positive gaming experience and receptiveness towards gamification from table 4. This shows

that receptiveness towards gamification is independent of positive gaming experience and intrinsic gaming motivations but is influenced by other factors. From the weak correlation, it can be infer that implementing game mechanics within education is interpreted by university students as distantly related to "pure" gaming seen from negligible positive influence.

Besides, the average mean of positive gaming experience (3.8995) is higher compared to receptiveness towards gamification (3.6324). A possible explanation for the low correlation as stated by Kember (2000), Asian students are passive learners and resists innovative learning methods. Besides that, Malaysian university students experience resistance towards the modification of the current education system due to long habitual adaptation and internalization since young.

Table 4: Correlations of Past Gaming Experience and Perceived Effectiveness of Gamification

		Receptiveness towards Gamification	**Perceived Learning opportunities**		**Academic Motivation**		
			Knowledge Acquisition & Application	**Personal & Social Skills**	**Intrinsic**	**Extrinsic**	**Amotivation**
Past Gaming Experience	r	0.163	0.154	0.160	0.120	0.164	0.310
	p	0.028	0.037	0.030	0.104	0.026	0.000

6.6 Hypothesis 2A.I: Personality influence intrinsic academic motivation

Performing ANOVA test, showed in table 5, there is a significant difference of 0.5 in the intrinsic academic motivation mean between personality types. By performing further analysis through post-hoc test, the differences in mean are between Idealist (mean=3.7041) and Guardian (mean=3.1604). Test for homogeneity of variances assumption is not met with a significant level of 0.324, $p>0.05$. Despite so, this still implies that when gamification is applied, there are clearly different responses of intrinsic motivation level for Idealists and Guardians. This may be resulted from the different learning styles of these two personalities. Idealists prefer learning through self-expletory with little guidelines. In contrast, guardians prefer routine and directed learning. Therefore, it can be concluded that gamification generates intrinsic academic motivation more effectively among students who are in favor of unstructured, flexible learning instead of step-wise learning.

6.7 Hypothesis 2A.II: Personality influence extrinsic academic motivation

Conducting ANOVA test, there is no significant difference in the extrinsic academic motivation mean ($p=0.372$, >0.05) showed in table 5. Test for homogeneity of variances is also violated as it is not significant ($p>0.05$). This shows that when gamification is applied within education, extrinsic academic motivation remains rather constant across all personalities. Similar to the explanation for the no correlation between PGE and extrinsic academic motivation (refer to 6.2), extrinsic academic motivation is influenced by external factors such as culture.

6.8 Hypothesis 2A.III: Personality influence amotivation academic motivation

There is no significant difference in the academic amotivation mean ($p=0.622$, >0.05) when ANOVA test is conducted (refer to table 5). Test for homogeneity of variances is also violated as it is not significant ($p>0.05$). Therefore, as a result, personality does not present as a determinant factor towards students' academic amotivation level when gamification is applied.

A possible explanation is that while personality does have an effect on intrinsic academic motivation due to the difference in learning styles, personality does not inherently account for the amotivation which is caused by other factors such as psychology well-being. Ryan and Deci's (2002) view of amotivation as being partly a function of perceived lack of competence and control has some similarities with the notion of learned helplessness.

6.9 Hypothesis 2B: Personality influence perceived learning opportunities

Analysing using ANOVA test, there is no significant difference (P=0.842, >0.05) in perceived learning opportunities mean across all personalities. Test for homogeneity of variances is violated as it is not significant (p>0.05). This shows that personality does not affect perceived learning opportunities. Applying this finding while referring to the moderate level of perceived learning opportunities, it can be infer that gamification has the flexibility to equally and effectively address the different learning styles exhibits by personality. Thus, this shows that gamification is able to benefit all sorts of student's personality and learning styles.

6.10 Hypothesis 2C: Personality influence receptiveness towards gamification

After conducting ANOVA test, it shows that there is no significant difference in the mean of receptiveness towards gamification within education across all personality types(p=0.348, >0.05). Test for homogeneity of variance is also violated as it is not significant (p>0.05). Receptiveness towards gamification within education is independent of personality types. Instead, receptiveness towards gamification within education is influenced by Asian learning culture and students' resistance to change as explained in section 6.5.

Table 5: ANOVA Testing of Different Personalities on Perceived Effectiveness of Gamification

		df	**SS**	**MS**	**F**	**P**
Receptiveness Towards Gamification	Between Groups	3	2.033	0.678	1.100	0.351
	Within Groups	182	112.129	0.616		
	Total	185	114.162			
Knowledge Acquisition and Application	Between Groups	3	2.299	0.766	1.185	0.317
	Within Groups	182	117.708	0.647		
	Total	185	120.007			
Personal and Social Skills	Between Groups	3	1.982	0.661	1.152	0.330
	Within Groups	182	104.392	0.574		
	Total	185	106.374			
Intrinsic Academic Motivation	Between Groups	3	8.476	2.325	4.131	0.007
	Within Groups	182	124.470	0.684		
	Total	185	132.946			
Extrinsic Academic Motivation	Between Groups	3	2.049	0.683	1.049	0.372
	Within Groups	182	118.538	0.651		
	Total	185	120.588			
Amotivation	Between Groups	3	1.647	0.549	0.591	0.622
	Within Groups	182	169.058	0.929		
	Total	185	170.706			

7. CONCLUSION: DISCUSSION, LIMITATION AND FURTHER RESEARCH

7.1 Discussion of Research Findings

The effectiveness of gamification within education remains mostly undeterminable based from our research findings. Personality and PGE plays a specific role in only influencing intrinsic academic motivation and academic amotivation respectively.

Narrowing down on personality, Idealist scored significantly higher than Guardians in the intrinsic academic motivation. This difference is inferred to the difference in preferred learning style, structured (Guardians) or unstructured (Idealists). When gamification is applied, students who are more incline towards unstructured learning tend to display higher intrinsic academic motivation. This clearly builds on the fact that gamification is a more flexible way to impart knowledge due to its infinite combination of game mechanics compared to the current education system (Lee & Hammer, 2011). Moving on, applying gamification would also address students' academic amotivation among students with positive gaming experience by giving them a reason of playing games to learn. However, this may prove problematic for educators as it is shown that intrinsic gaming motivation does not naturally leads to intrinsic academic motivation. Nevertheless, this would provide a starting point for gamification in education to slowly inculcate students' intrinsic academic motivation through providing appealing learning methods that encourage autonomy and increase self-efficacy (Lee and Hammer, 2011).

Receptiveness towards gamification and perceived learning opportunities, the two other determinant for gamification effectiveness are not significantly influence by personality and PGE. A probable factor that influences receptiveness towards gamification would be cultural/societal context which was held fixed before testing the research hypothesis model. (Elaborate) On the other hand, perceived learning opportunities would seem to be immeasurable factor within this research paper as test simulations are needed for students to experience gamification within education in order to capture feedback accurately.

Table 6: Summary of Significant Research Findings

No.	Summary of Significant Research Findings
1.	Personality (Idealist and Guardians) /Learning styles (structure and unstructured) affects intrinsic academic motivation.
2.	Past gaming experience has a negative influence on academic amotivation.
3.	Personality/Learning styles do not affect extrinsic academic motivation, academic amotivation, perceived learning opportunities and receptiveness towards gamification within education.
4.	Past gaming experience/intrinsic gaming motivation do not have influence towards intrinsic, extrinsic academic motivation, perceived learning opportunities and receptiveness towards gamification within education.

7.2 Social Implications

Assessing the effectiveness and practicality of implementing gamification within education in Malaysia, the general responses towards the idea of gamification are mildly positive (means ranging from 3-4). These mild responses from participants may be attributed from the influence of "uncertainty avoidance" as explained in section 5.1 due the fact that they are exposed to a

new educational concept. Under such influence, respondents become rather conservative when selecting their response when answering the questionnaire.

Despite so, it should be noted that intrinsic academic motivation (3.4247) is rated higher than extrinsic academic motivation (3.1398), this shows that gamification in education generates slight intrinsic academic motivation and insignificant extrinsic motivation. In addition, gamification is able to curb academic amotivation (2.3952) to a slight extent among Malaysian students. It can be concluded that gamification can help address the lack of intrinsic and proper academic motivation by improving and Malaysian students' perceptions and intentions to learn. Furthermore, inferring from the positive perceived learning opportunities (3.4684) and the independent relationship between personality and perceived learning opportunities, this shows that gamification within education favors students of all types of personality equally, enabling every student to benefit from it.

However, the concept of applying gamification into education must be introduced through a smooth transition for university students to slowly adapt and internalize this concept due to long habitual exposure to the old education system. Besides, although not within the scope of this research, introducing gamified education into primary or secondary school or secondary school may prove more effective as younger learners are more adaptable to change.

7.3 Research Limitation

There are a few generalization made in this research paper whereby some applied theories extracted from other journals are not backed with empirical data. Furthermore, due to the limited resources pertaining to this research, a simulation of a gamified education class/system cannot be performed to capture participants' experience and feedback which provides more accurate data. The method of data collection through surveys used in this research paper are less accountable because the data collected are merely respondents' perception which may vary greatly compared to experiencing gamification first-hand. Data collected were also concentrated among Sunway University students, thus does not provide an accurate overview of Malaysian university students. This may have undermined the credibility of the data collected, and the research results tabulated.

7.4 Further Research

While this research paper provides some grounds on factors affecting the effectiveness of gamified education, there are numerous further researches that can be done. A similar research can be conducted with data collected from test simulation to capture more accurate data. As seen from this research, culture is hypothesized to be a highly influential factor. Possible future researches can be conducted to assess the influence of different culture characteristics by widening the research scope to multiple countries instead of one. Besides, further researches are needed to be done to narrow the scope specifically towards the effects of gamified education on learning styles in order to provide a detailed classification on the varying degrees of gamification effectiveness across all learning styles. Lastly, rather than targeting students from tertiary education, potential further researches can perform similar researches on students from kindergartens, primary or secondary schools.

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